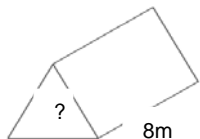




Topic: Surface area and volume of spheres, cones, pyramids and compound solids.

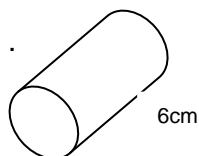
Starter

1. Find the area of the cross section.



Volume = $272m^3$

2. Calculate the radius of the cylinder



Volume = $301.6 cm^3$

Top Tips!

Volume of a **pyramid** = $\frac{1}{3} \times \text{area of base} \times \text{height}$

Need to learn the above formula, it won't be given.

Volume of a **cone** = $\frac{1}{3} \pi \times r^2 \times h$

Surface area of a **cone** = $\pi \times r \times l$
 (l is the length of the slanted or sloping side)

Volume of a **sphere** = $\frac{4}{3} \times \pi \times r^3$

Surface area of a **sphere** = $4 \times \pi \times r^2$

Skills:

1. Calculate the volume of this pyramid when the area of the base is $32 cm^2$ and the height is 18cm.



2. Find the volume of the cone which has a diameter of 8cm and a height of 13cm.

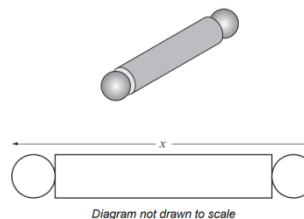


3. Calculate the surface area of this sphere which has a diameter of 9cm.



Examination Question: 2016 Summer Unitised U1 Higher Q 15

Two solid, identical spheres are attached to the ends of a solid cylinder, as shown below.



The radius, r , of each sphere is the same as the radius of the cylinder.

The length of the cylinder is $9r$.

The volume of the whole object is $3340 cm^3$.

Calculate the total length, x , of the object. [6]

Assessment for Learning

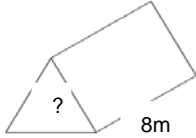
Video / QR code



Topic: Surface area and volume of spheres, cones, pyramids and compound solids.

Starter

1. Find the area of the cross section.



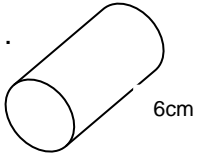
Volume = $272m^3$

$272 = ? \times 8$

$? = \frac{272}{8}$

$? = 34m^2$

2. Calculate the radius of the cylinder



Volume = $301.6 cm^3$

$301.6 = \pi r^2 \times 6$

$\frac{301.6}{6\pi} = r^2, r = 4cm$

Top Tips!

Volume of a **pyramid** = $\frac{1}{3} \times \text{area of base} \times \text{height}$

Need to learn the above formula, it won't be given.

Volume of a **cone** = $\frac{1}{3} \pi \times r^2 \times h$

Surface area of a **cone** = $\pi \times r \times l$

(l is the length of the slanted or sloping side)

Volume of a **sphere** = $\frac{4}{3} \times \pi \times r^3$

Surface area of a **sphere** = $4 \times \pi \times r^2$

Skills:

1. Calculate the volume of this pyramid when the area of the base is $32 cm^2$ and the height is 18cm.

$\frac{1}{3} \times 32 \times 18 = 192cm^3$



2. Find the volume of the cone which has a diameter of 8cm and a height of 13cm.



$\frac{1}{3} \times \pi \times 4^2 \times 13$

$= 217.8cm^3$ (1. d. p)

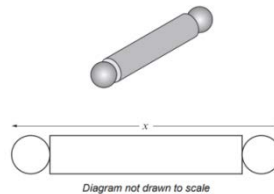
3. Calculate the surface area of this sphere which has a diameter of 9cm.

$4 \times \pi \times 4.5^2 = 254.5cm^2$ (1. d. p)



Examination Question: 2016 Summer Unitised U1 Higher Q 15

Two solid, identical spheres are attached to the ends of a solid cylinder, as shown below.



The radius, r , of each sphere is the same as the radius of the cylinder.

The length of the cylinder is $9r$.

The volume of the whole object is $3340 cm^3$.

Calculate the total length, x , of the object. [6]

Volume of 2 spheres = $\frac{8}{3} \times \pi \times r^3$ $r^3 = 91.1275 \dots, r = 4.5cm$ (1.d.p)

Volume of cylinder = $9r \times \pi r^2 = 9\pi r^3$

Total length $x = 9r + d + d = (9 \times 4.5) + 9 + 9 = 58.5cm$

$\frac{8\pi r^3}{3} + 9\pi r^3 = 3340$

$r^3 \left(\frac{8\pi}{3} + 9\pi \right) = 3340$

Assessment for Learning

Video / QR code